

## PATENT CLAIMS

1. A method for the formation of a good contact surface on a support bar of an aluminium cathode used in electrolysis, onto the end of which bar a copper contact piece is attached, wherein the cathode plate is immersed in an electrolysis cell and the support bar is supported by its ends on the sides of the electrolysis cell so that the contact piece is located on top of a busbar, **characterised in that** the area on the lower surface of the support bar contact piece, the contact surface, which is to touch the electrolysis cell busbar, is coated with a highly electroconductive metal or metal alloy.  
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2. A method according to claim 1, **characterised in that** before coating the contact piece a transmission layer is formed on the contact surface.  
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3. A method according to claim 2, **characterised in that** the transmission layer is tin or a tin-dominant layer.  
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4. A method according to any of claims 1 - 3, **characterised in that** the highly electroconductive coating layer is silver.  
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5. A method according to any of claims 1 - 3, **characterised in that** the highly electroconductive coating layer is a silver-copper alloy.  
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6. A method according to any of claims 1 - 5, **characterised in that** the highly electroconductive coating layer is formed using soldering technique.  
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7. A method according to any of claims 1 - 5, **characterised in that** the highly electroconductive coating layer is formed using thermal spraying technique.

8. A method according to claim 7, **characterised in that** the thermal spraying technique is based on gas combustion.
- 5 9. A method according to claim 7 or 8, **characterised in that** the thermal spraying technique is high velocity oxy-fuel spraying.
10. A method according to any of the above claims, **characterised in that** the highly electroconductive coating material is in powder form.
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11. A method according to claim 7 or 8, **characterised in that** the thermal spraying technique is flame spraying.
- 15 12. A method according to any of claims 1 – 8 or 11, **characterised in that** the highly electroconductive coating material is in wire form.
13. A method according to any of the above claims, **characterised in that** the highly electroconductive coating material forms a metallurgical bond between the copper contact piece of the support bar and the transmission layer.
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14. A method according to any of the above claims, **characterised in that** the contact surface is subjected to heat treatment after coating.
- 25 15. A method for the repair of contact surface of an aluminium cathode support bar used in electrolysis, wherein a copper contact piece is attached to one end of the support bar, in electrolysis the cathode plate is immersed into an electrolysis cell and the contact piece of the support bar is supported on the electrolysis cell busbar, **characterised in that** the lower surface acting as the contact surface of the support bar contact piece is first straightened out linearly and then coated with a highly electroconductive metal or metal alloy,
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whereupon first a transmission layer of tin is formed on the lower surface and on top of this a highly electroconductive coating so that the copper, tin and highly electroconductive coating form a metallurgical joint.

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16. A method for the repair of contact surface of an aluminium cathode support bar used in electrolysis, wherein a copper contact piece is attached to one end of the support bar and the lower edge of the contact piece is furnished with a notch, in electrolysis the cathode plate is immersed into an electrolysis cell and the support bar is supported on the electrolysis cell busbar at the notch, **characterised in that** the inclined sides of the notch act as the contact surface of the support bar contact piece, and are first straightened out linearly and then coated with a very electroconductive metal or metal alloy, whereupon first a transmission layer of tin is formed on the sides and on top of this a highly electroconductive coating so that the copper, tin and very electroconductive coating form a metallurgical joint.
  
17. A support bar for an aluminium cathode used in electrolysis, where a cathode plate of the cathode is meant to be immersed in an electrolysis cell and the cathode support bar to be supported at its ends on the edge of the electrolysis cell, so that a contact piece of copper is attached to one end of the support bar, **characterised in that** the area of the lower surface of the support bar contact piece, the contact surface touching the busbar, is coated with a highly electroconductive metal or metal alloy.
  
18. A support bar according to claim 17, **characterised in that** before the coating of the copper contact piece a transmission layer is formed on the contact surface, which is tin or a tin-dominant alloy.

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19. A support bar according to claim 17 or 18, **characterised in that** the highly electroconductive coating layer is silver.
20. A support bar according to claim 17 or 18, **characterised in that** the highly electroconductive coating layer is a silver-copper alloy.  
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21. A support bar according to any of claims 17 - 20, **characterised in that** the highly electroconductive coating layer is formed using soldering technique.  
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22. A support bar according to any of claims 17 - 20, **characterised in that** the highly electroconductive coating layer is formed using thermal spraying technique.
- 15 23. A support bar according to any of claims 17 - 22, **characterised in that** the highly electroconductive coating material forms a metallurgical joint with the transmission layer and the copper of the contact piece.